

# Our Goal:

## All Waters in Region 5 Will Support Fish Populations with Safe Levels of Contaminants

Fishing is one of the most popular forms of outdoor recreation in the Midwest, and Americans are eating more fish as our diets shift toward more low-fat foods (for additional information, see <http://www.usda.gov/factbook/intro.htm>, which provides statistics on fish consumption). Fish consumption, however, has been shown to be a major pathway of human as well as wildlife exposure to persistent toxic substances such as polychlorinated biphenyls (PCBs) and mercury. Contaminants released from many sources are transported through the environment and are carried into streams and lakes. Small organisms absorb these contaminants in water and are in turn eaten by other organisms and small fish. Some of these contaminants bioaccumulate in the fish – and in humans who eat them – to levels that can pose health risks.

State fish consumption advisories are issued to protect people from potential adverse health effects associated with contaminants found in fish. These advisories recommend amounts and types of fish that are safe to eat. Fish consumption advisories may also include information to educate the public on how to minimize exposure to certain contaminants through proper preparation and cooking of fish. The advisories are viewed as a temporary measure to protect the public while control measures and site cleanups reduce contamination in water to safe levels.

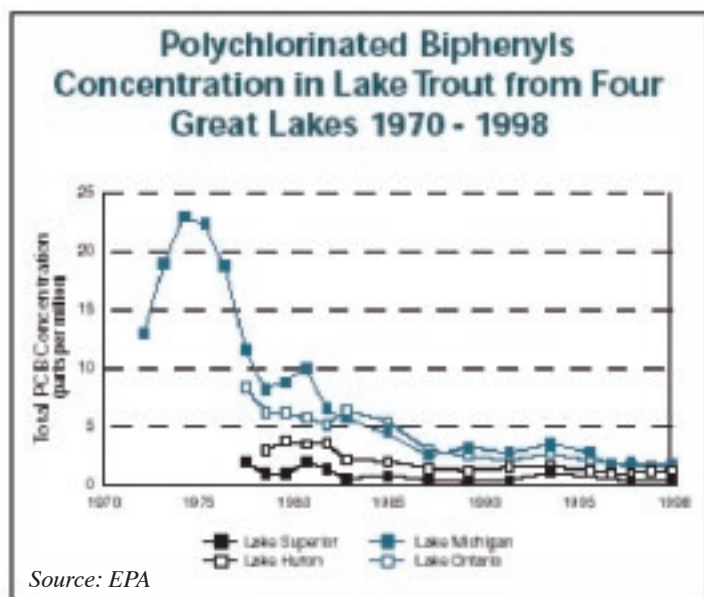


### What Substances Contaminate Fish?

Mercury, PCBs and dioxin are the contaminants of greatest concern in Region 5 fish. These contaminants originate from various sources. Mercury occurs naturally and is distributed throughout the environment by both natural processes and human activities. Solid waste incineration and fossil fuel combustion facilities generate approximately 87 percent of the mercury emissions in the United States. There are no known natural sources of PCBs; therefore, all sources of PCBs are related to commercial manufacturing, storage and disposal activities. The manufacture of PCBs was banned in the United States in 1979; however, PCB-containing products manufactured before the ban may still be in use. Dioxin is also not a natural chemical. Manufacturing processes, paper bleaching and burning of various organic materials have resulted in incidental creation of dioxin and its release into the environment. In the past, DDT and a number of other pesticides had been present at levels of concern in the region, but their levels have declined dramatically in most places since they were taken off the market. Levels of other contaminants such as PCBs have also declined noticeably since their ban (see Figure 3-1).

Since the 1970s, EPA, other federal agencies and the states have aggressively tested fish found in Region 5's waters for contaminants. Region 5 states analyze 3,500 to 4,000 fish tissue samples each year. States may test a number of species sampled at a

**Figure 3-1**



single site for a variety of contaminants (see Figure 3-2). Because a major objective of fish testing programs is assessing risk to human health, wildlife or both, sampling sites are selected where fishing is popular or in waters that are known or suspected to contain higher contaminant levels. Because these programs are not specifically designed to track trends, data for the Great Lakes is often used for this purpose.

The states use the information collected to reduce people's exposure to contaminants by issuing advisories to help people choose what fish to eat as

well as how often and how much. This information is not intended to discourage people from eating fish, but it should be used as a guide for choosing fish that are low in contaminants. After consulting the advisories, people may find that they do not have to change their fish consumption habits, or they may choose to eat different fish or to space fish meals farther apart. The number of advisories issued varies by state (see Figure 3-3).

While fish are a good, low-cost, low-fat source of nutrition, some individuals, particularly pregnant women, developing fetuses and young children, are more sensitive to contaminants than the general adult population. State fish consumption advisories include advice specifically targeted to these sensitive populations.

As noted above, the primary contaminants that lead to issuance of fish consumption in Region 5 include mercury, PCBs, and dioxin. The levels of PCBs in fish have declined significantly over the last 25 years since their manufacture and sale were curtailed, and dioxin levels have decreased over the past 10 years as its sources were controlled. Mercury levels in fish have remained generally stable. Recent research linking mercury to developmental problems in children has resulted in a more stringent threshold for mercury in fish. All the Region's states now have revised fish advisories reflecting this new threshold.

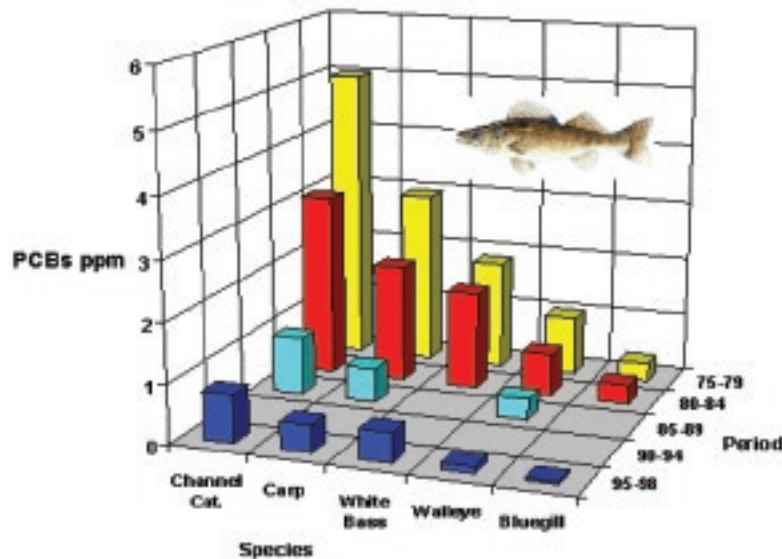
### **Fish Contaminant Research and Pollution Control Follow-Up**

By the late 1970s, it had become obvious that fish could accumulate pollutants to levels posing human health concerns. During this period, analytical methods and equipment were improving to the point that low—yet potentially unhealthy—levels of contaminants could be detected in fish tissue. A plan was developed by the EPA Regional Office in Chicago and the Duluth Research Laboratory to use fish tissue analysis to search for previously unidentified sources of bioaccumulative contaminants and to scan the tissue samples for contaminants that had not been previously identified. This project was one of the earliest attempts to team up experts in laboratory analysis, staff with knowledge of manufacturing facilities and processes, and state and federal fish experts in order to systematically search for and identify fish tissue contaminant issues.

The results of the study provided an increased understanding of bioaccumulative pollutants and their possible sources in the region that has been critical to regulatory activities and investigations since that time. Experience gained in this study and a concurrent regional analysis of manufacturing processes conducted to identify contaminant sources provided the basis for pollution control efforts that continue today. For example, industrial facilities that discharge waste to municipal wastewater treatment plants must follow pretreatment regulations to control pollutants that might otherwise interfere with plant processes or contaminant biosolids. This has helped to control sources of contaminants. Another spinoff of the study has been development and implementation of new fish tissue analysis procedures that have aided the development of fish consumption advisories. Overall, the study has led to significant reductions in bioaccumulative pollutants in fish and wildlife in the Great Lakes region and a better-informed public.

**Figure 3-2**

### Median PCB Concentrations of Different Fish Species in the Upper Mississippi River



This illustration shows median PCB concentrations (in parts per million [ppm]) in fillets of different fish species collected from the upper Mississippi River by the Wisconsin Department of Natural Resources (WDNR) from 1975 to 1998. Over this 24-year period, WDNR intensively monitored PCB concentrations in the upper Mississippi River. Evaluation of the fish fillet data clearly show higher PCB concentrations in channel catfish, carp and white bass than in walleye and bluegill. These differences were most pronounced in the fish collected during the late 1970s and early 1980s before widespread PCB regulation reduced the amount of PCBs in the environment. The fat content of channel catfish, carp and white bass is greater than that of walleye and bluegill and is an important factor influencing the differences in PCB concentrations.

Source: WDNR

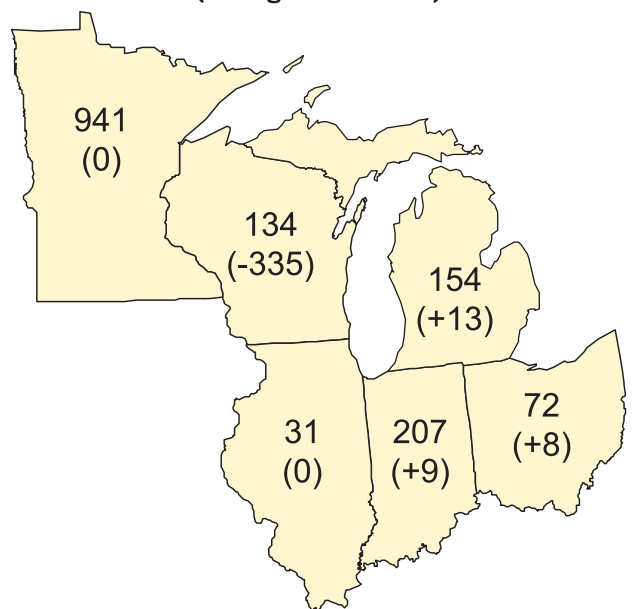
### What Is Being Done to Make Fish Safer?

EPA and the states have had significant success in reducing the levels of persistent chemicals in the environment. Levels of such substances as DDT and PCBs in fish decreased significantly when their use was banned in the 1970s and 1980s. EPA is examining policies that will reduce mercury releases to the environment through various source reduction and regulatory programs.

Contaminated sediment in waterways is a significant source of fish tissue contamination. Substances found in sediment reflect the land uses in the watersheds of the region. A number of industries have been identified as potential sources of specific contaminants and have been required to change their processes in order to reduce or prevent their generation of these substances. In addition, runoff from agricultural lands may carry agricultural chemicals and unsafe levels of nutrients into water bodies. Urban runoff also contributes sediment contaminated with pesticides, nutrients, oils and other pollutants.

**Figure 3-3**

### Total Number of Fish Consumption Advisories - 2001 (Change from 2000)



The Region 5 states issue 58 percent of all fish advisories in the United States, reflecting a long history of these states monitoring and assessing fish contaminants. As a result, more and better information is provided to the region's citizens to protect public health. Source: EPA



## Finding Mercury in Minnesota Schools

Mercury is found in fish from many of Minnesota's more than 14,000 lakes, and no individual is doing more to raise public awareness about the impacts of this toxic metal than Clancy, the Minnesota Pollution Control Agency's (MPCA) mercury-detecting dog. This energetic Labrador retriever mixed breed, a linchpin of the agency's Mercury-Free Zone Program, is the only dog in the nation trained to detect vapor from as little as a half gram of mercury.



Photograph by David L. Hansen

EPA's Great Lakes National Program Office, the Minnesota Office of Environmental Assistance, Xcel Energy and the St. Paul Police Department Canine Unit provided funding and in-kind services to MPCA to train Clancy for the statewide Mercury-Free Zone Program, which debuted in October 2001.

To date, 150 schools have pledged to become mercury-free zones, and Clancy's investigative skills have resulted in removal of 250 pounds of mercury from participating schools. For more information, visit MPCA's web site at <http://www.pca.state.mn.us/programs/mercury-free/index.html>.

Clancy works through a science classroom with his trainer and handler Carol Hubbard, locating broken thermometers and fluorescent tubes, forgotten mercury in cabinets, accumulations in sink U-bends and spills in the cracks between floorboards and tiles.

All these sources are being targeted by Region 5 and the states through a range of policies. EPA works closely with the states to clean up contaminated sediment so that it does not pose a threat. EPA and the states have taken a

multimedia approach to contaminant cleanup through such programs as Superfund, the Resource Conservation and Recovery Act (RCRA), state cleanups and voluntary remediation programs.

Sources of mercury contamination are being

## Dioxin Sources – Burn Barrels in Indiana and Michigan

Dioxin has been identified as a fish tissue contaminant that causes fish consumption advisories. Dioxin is created as a by-product of the manufacture and burning of organic chemicals and plastics that contain chlorine. Many large combustion sources are now controlled to prevent dioxin formation. One of the major sources of dioxin, however, is backyard burning of trash in "burn barrels."

In Indiana, it is against the law to burn garbage or household trash such as household waste, plastic, batteries, rubber, disposable diapers and painted or stained wood. In addition, there are local open burning laws that provide more limitations. For more information, see <http://www.in.gov/idem/air/compliance/burn.html>.

A "Burning Household Waste" brochure developed by the Michigan Department of Environmental Quality (MDEQ) lists pollutants emitted from burn barrels, some of the health consequences and national household burn barrel emissions. It is available at the MDEQ Environmental Assistance Center, from district staff or at <http://www.deq.state.mi.us/documents/deq-aqd-bhw.pdf>.



Source: EPA

## Tribal Monitoring of Fish Contaminants

Fish and other aquatic species are an important food source for many tribal peoples. Tribe members consume significantly greater amounts of fish than other residents of the Midwest. For this reason, it is especially important for tribes to understand what contaminants are present in fish tissues and the health risks that these contaminants may pose.

**Great Lakes** - For the past several years, an intertribal consortium in Michigan has collected fish samples from waters of the Great Lakes used by tribal fishers and analyzed the samples for contaminants. The fish tissue data is compared with Food and Drug Administration (FDA) action levels to determine the saleability and safety of the fish for human consumption. Lake Huron was sampled in 1999 and Lake Michigan in 2000. The analyses showed that the whitefish and lake trout collected had contaminant levels below the FDA action levels.

The data collected in 1999 and 2000 was compared with data from previous years to assess trends. The data demonstrates dramatic declines in PCB levels in whole lake trout from 1972 to 1990. Since 1990, the data has fluctuated, and there has been no further obvious decline. Mercury concentrations have generally been constant.

**Inland Lakes** - For several years, a number of tribes in Minnesota and Wisconsin and an intertribal consortium in Wisconsin have collected fish samples from inland lakes fished by tribe members, analyzed the samples and developed tailored education and outreach information for tribe members on potential risks associated with eating the fish. The intertribal consortium in Wisconsin uses an innovative system for communicating the risks of consuming walleye in which maps of the lakes are color-coded (see <http://www.glifwc.org/>).

addressed through voluntary efforts such as clean sweep programs and thermostat trade programs that encourage people to properly dispose of mercury-containing products. EPA is also working with the Region 5 states to develop proposed policies to virtually eliminate mercury emissions.

Cleaning up the legacy of contaminated industrial sites and sediment continues to be a high priority, and some progress has been made toward cleaning up the most highly contaminated sites in recent years. From 1997 to 2001, almost 2 million cubic yards of contaminated sediment was remediated at sites within the Region 5 portion of the Great Lakes basin. Furthermore, progress

is being made to minimize future siltation and sediment contamination problems.

## Hook into Healthy Fish

You cannot see, smell or taste mercury, PCBs or dioxin in fish. That is why it is important to know which fish are safer than others to eat. State health programs in Region 5 have joined together to improve public understanding of fish consumption advice (see Figure 3-4). One product of their efforts is a common theme, "Hook into Healthy Fish." They are promoting selection of fish with the lowest contaminant levels for home consumption. There is no need to stop eating fish. By following health guidelines and selecting fish carefully, you can reduce your exposure to contaminants, reduce your health risks and still get the benefits of eating fish.

When you're deciding which fish are safer to eat, keep in mind that larger fish, older fish and fatty fish generally have greater amounts of contaminants. Fish that feed on other fish—such as walleye, northern pike and bass—have the greatest amounts of mercury in their meat. They can still be eaten in reasonable quantities, but both you and the fishery will benefit if the larger individuals are released or kept only when they are trophy-sized.

### To reduce your risk of exposure to contaminants in fish,

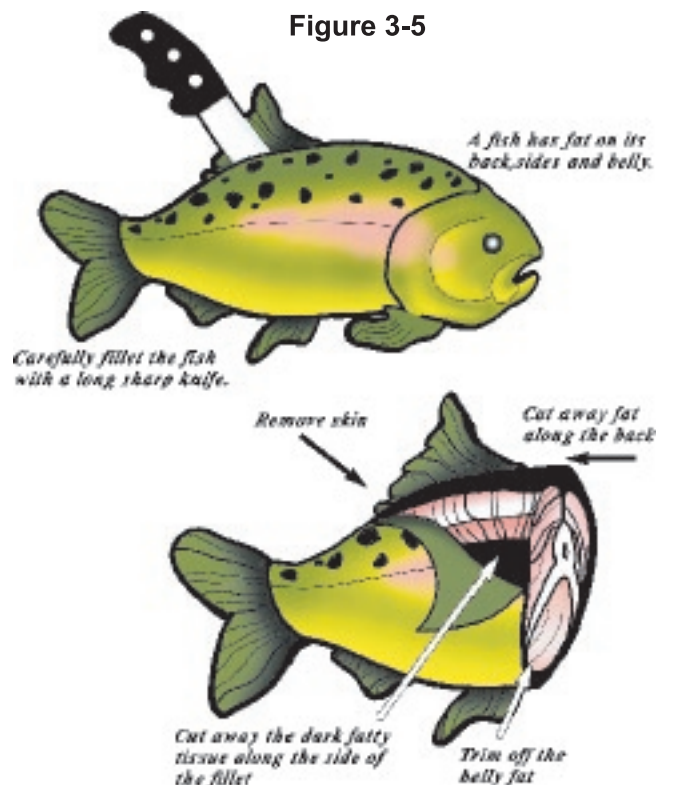
- Eat smaller fish.
- Eat more panfish (such as sunfish and crappies) and fewer predator fish (such as walleye, northern pike and lake trout).
- Trim fish skin and fat, especially belly fat, and eat fewer fatty fish such as carp, catfish and lake trout. PCBs build up in fish fat. Mercury cannot be removed from fish through cleaning or cooking because it gets into their flesh; however, you can reduce the amounts of other contaminants like PCBs by removing fat when you clean and cook fish (see Figure 3-5).

**Figure 3-4**



Source: Wisconsin Department of Public Health

**Figure 3-5**



Source: WDNR

### Fish Contaminant Monitoring in Michigan

MDEQ conducts fish contaminant monitoring in the waters of Michigan. The goals of the monitoring are to determine the need for sport fish consumption advisories and commercial fishing regulations, identify water quality trends and evaluate whether existing programs are effectively reducing chemical contamination in the water.

Edible portion fish tissue samples, caged fish samples and whole adult fish samples are analyzed to address fish contaminant monitoring goals. MDEQ collected edible portion samples from 38 sites in 2000. Based on monitoring results, sport fish consumption advisories were relaxed at nine of the water bodies that had been monitored prior to 2000. Also, recent caged fish monitoring demonstrates the effectiveness of source control and contaminated sediment removal at sites like Portage Creek and River Raisin. In addition, results of EPA's and MDEQ's whole fish monitoring indicate that contaminant concentrations declined dramatically (because of the banning and phaseout of many pesticides and PCBs) between the late 1970s and early 1980s and then either stabilized or declined more slowly.

### Where Can You Find Information About Local Fish Advisories?

Individual state fish advisories can be found at the following web sites:

**Illinois:** <http://www.idph.state.il.us/envhealth/fishadv/fishadvisory02.htm>

**Indiana:** [http://www.state.in.us/isdh/dataandstats/fish/fish\\_adv\\_index.htm](http://www.state.in.us/isdh/dataandstats/fish/fish_adv_index.htm)

**Michigan:** [http://www.michigan.gov/documents/Fishing\\_Advisory\\_2002\\_26575\\_7.pdf](http://www.michigan.gov/documents/Fishing_Advisory_2002_26575_7.pdf)

**Minnesota:** <http://www.health.state.mn.us/divs/eh/fish/index.html>

**Ohio:** <http://www.odh.state.oh.us/alerts/fishadv.pdf>

**Wisconsin:** <http://www.dnr.state.wi.us/org/water/fhp/fish/advisories>